

CLAIMS

1. A paint film forming method comprising applying color base paint onto rigid resin parts and then clear paint and curing the two paint films, which is characterized by using, as said clear paint, a clear paint comprising 60–90% by weight of a hydroxyl-containing acrylic resin (A) and 10–40% by weight of a curing agent (B), based on the combined solid content of the acrylic resin (A) and the curing agent (B),

said acrylic resin (A) having a hydroxyl value of 80–160 mgKOH/g and being prepared by radical-copolymerizing (a) 8–30% by weight of a primary hydroxyl-containing monomer selected from 4-hydroxybutyl (meth)acrylate monomers and ϵ -caprolactone-modified vinyl monomers obtained by ring-opening polymerization of ϵ -caprolactone with hydroxyalkyl (meth)acrylate; (b) 10–40% by weight of secondary hydroxyl-containing monomer; and (c) 30–82% by weight of still other polymerizable unsaturated monomer.

2. The method according to Claim 1, in which the color base paint is one-package color base paint comprising polyester polyol having a hydroxyl value of 40–120 and aliphatic and/or alicyclic blocked polyisocyanate which is formed by blocking hydroxy compound-modified isocyanurate type polyisocyanate with dialkyl malonate and acetoacetic acid ester.

3. The method according to Claim 1, in which the hydroxyl-containing acrylic resin (A) has a hydroxyl value within a range of 100–140 mgKOH/g.

4. The method according to Claim 1, in which the hydroxyl-containing acrylic resin (A) has a weight-average molecular weight within a range of 5,000–20,000.

5. The method according to Claim 1, in which the hydroxyl-containing acrylic resin (A) has an acid value within a range of 0–40

mgKOH/g.

6. The method according to Claim 1, in which said ϵ -caprolactone-modified vinyl monomer is represented by the following formula (I):



wherein

R^1 is hydrogen or methyl,

R^2 is $\text{C}_2\text{-C}_6$, in particular, $\text{C}_2\text{-C}_3$ alkylene, and

n is an integer of 1-10, preferably 1-5.

7. The method according to Claim 6, in which R^1 is hydrogen and R^2 is ethylene.

8. The method according to Claim 1, in which the secondary hydroxyl-containing monomer (b) is selected from the group consisting of 2-hydroxypropyl (meth)acrylate, 2-hydroxybutyl (meth)acrylate, 3-hydroxybutyl (meth)acrylate and adducts of (meth)acrylic acid with an epoxy-containing compound.

9. The method according to Claim 1, in which the secondary hydroxyl-containing monomer (b) is 2-hydroxypropyl (meth)acrylate.

10. The method according to Claim 1, in which other polymerizable unsaturated monomer (c) is selected from the group consisting of styrene, alkyl esters of (meth)acrylic acid and (meth)acrylic acid.

11. The method according to Claim 1, in which the hydroxyl-containing acrylic resin (A) is obtained by radical copolymerizing 10-25% by weight of the monomer (a), 15-35% by weight of the monomer (b) and 40-75% by weight of the monomer (c).

12. The method according to Claim 1, in which the curing agent (B) is an optionally blocked polyisocyanate compound.
13. The method according to Claim 1, in which the clear paint contains the acrylic resin (A) and the curing agent (B) at the ratio of, based on the combined solid content of the two, 65–85% by weight of the acrylic resin (A) and 15–35% by weight of the curing agent (B).
14. The method according to Claim 1, in which the clear paint further contains 1–20% by weight of hydroxyl-containing oligomer (C), based on the combined solid content of the acrylic resin (A) and the curing agent (B).
15. The method according to Claim 14, in which the hydroxyl-containing oligomer (C) is a reaction product of a carboxyl-containing compound with an epoxy-containing compound.
16. The method according to Claim 14, in which the hydroxyl-containing oligomer (C) has a hydroxyl value within a range of 200–800 mgKOH/g.
17. The method according to Claim 14, in which the hydroxyl-containing oligomer (C) has a weight-average molecular weight not higher than 1,000.
18. The method according to Claim 1, in which the curing of the both paint films of the color base paint and clear paint is conducted by 2-coat-1bake system or 2-coat-2-bake system.
19. The method according to Claim 1, in which the curing is conducted at temperatures of 60–70°C.
20. A clear paint comprising 60–90% by weight of a hydroxyl-containing acrylic resin (A) and 10–40% by weight of a curing agent (B), based on the combined solid content of the acrylic resin (A) and

the curing agent (B),

said acrylic resin (A) having a hydroxyl value of 80–160 mgKOH/g and being prepared by radical-copolymerizing (a) 8–30% by weight of a primary hydroxyl-containing monomer selected from 4-hydroxybutyl (meth)acrylate monomers and ϵ -caprolactone-modified vinyl monomers obtained by ring-opening polymerization of ϵ -caprolactone with hydroxyalkyl (meth)acrylate; (b) 10–40% by weight of secondary hydroxyl-containing monomer; and (c) 30–82% by weight of still other polymerizable unsaturated monomer.

21. Painted goods obtained by the method as described in Claim 1.